

THE ESTIMATED INCIDENCE OF UPPER STATION LATE RUN SOCKEYE SALMON
IN THE ALITAK BAY DISTRICT, INNER AKALURA SECTION FISHERY
OF 20 AUGUST 1992.

By

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INTRODUCTION

The Alitak Bay District, located on the southern end of Kodiak Island, supports several sockeye salmon runs (Figure 1). Notable are the Frazer Lake, early Upper Station, late Upper Station, and Akalura Lake runs. The Frazer and early Upper Station runs migrate during June and early July, while the late Upper Station run has migration timing of late July through early September. The Akalura run is mainly a late run stock with timing similar to the late Upper Station run.

The Alitak Bay District sockeye runs are managed by the Alaska Department of Fish and Game (ADF&G) in accordance with the Board of Fisheries adopted plan (ADF&G 1992; Appendix A). The intent of the plan is to achieve salmon escapement and harvest objectives while maintaining traditional fishing opportunities by gear type. The plan specifies that the Inner and Outer Akalura Sections are to be managed for Akalura sockeye salmon from 9 June through 20 August, Akalura sockeye and coho salmon from 21-26 August, and coho salmon post 26 August. The Inner and Outer Upper Station Sections are managed exclusively for Upper Station sockeye and coho salmon.

On 20 August 1992, the Inner Akalura Section was opened to commercial salmon fishing for nine hours starting at 1200 hours (Appendix B). Approximately, 34 set gill net permit holders participated in the fishery, and harvested 9,263 sockeye, 587 pink, 69 coho, and 44 chum salmon. During this time, other Alitak Bay District Sections were closed in an attempt to achieve late Upper Station sockeye escapement objectives.

Prior to the fishery, there was concern that an opening in the Inner and Outer Akalura Sections might jeopardize the Upper Station late run sockeye escapement. To minimize the likelihood of this occurring, only the Inner Akalura Section was opened to fishing on 20 August. The purpose of this paper is to determine whether Upper Station late run sockeye salmon contributed to the Inner Akalura Section catch and if so, to what degree.

METHODS

ADF&G, Division of Commercial Fisheries compiled the commercial catch numbers used in this report from individual sale receipts (fish tickets). The numbers should be considered accurate but not necessarily precise. Small changes may occur as the data are edited and updated. The fish ticket summary report used in this report was prepared on 4 September 1992.

The Frazer, Upper Station, and Akalura sockeye systems were sampled almost weekly for age, length, and sex (ALS) data. The targeted sample size was 240 fish per week per system. Standard sampling procedures were followed (Holmes 1992). Fish ages were determined from scales; the steps used to process and read the scale collections for age determination are described in Murphy (1992). Since there was no sorting or selection for fish size and or condition, the escapement samples were considered representative of the escapement at the time of sampling.

A 600 fish ALS sample was collected from the 20 August catch in the Inner Akalura Section. The sampling occurred onboard the tender M/V Difiance within upper Olga Bay. The fish sampled were unsorted and assumed to be representative of the catch.

All fish ages cited in this report are in the European notation.

An age marker was used to determine the contribution of the Upper Station late run fish to the fishery. The marker consisted of age-0.2 and age-0.3 fish combined, and it was assumed sockeye salmon of these ages were only present in the Upper Station late run. Age-0.1 fish were not considered due to an assumed set gill net gear selectivity against age- .1 fish.

The formula used for the calculation was:

$$X = B/A$$

where: A = Estimated percentage of age-0.2 and age-0.3 sockeye salmon in the Upper Station late run escapement during the Inner Akalura Section fishery.

B = Estimated percentage of age-0.2 and age-0.3 sockeye salmon in the Inner Akalura Section catch.

X = Estimated percentage of Upper Station late run fish in the Inner Akalura Section catch.

While multiple Upper Station escapement samples were available, the weekly sample of 20 August was used in the above formula. It was assumed that this sample best approximated the true age composition of the late Upper Station run at the time of the fishery.

In determining the approximate 95% confidence upper limit of the contribution of Upper Station late run to the fishery, it was assumed that:

1. Age-0.2 and 0.3 fish were only present in the late Upper Station run.; and
2. The proportion of age-0.2 and age-0.3 adults in the weekly Upper Station late run escapement at the time of the Inner Akalura Section fishery was no lower than the lowest proportion of age-0.2 and 0.3 fish observed in the weekly samples.

The first step was determining the 95% confidence upper limit for the percentage of Upper Station late run fish in Inner Akalura Section catch from the number of observed age-0. fish and size of the sample. This was done by assuming a binomial distribution for the number of age-0. fish in the Inner Akalura catch sample (presence/absence of age-0. fish in the sample and population). The 95% confidence upper limit value was determined using the program SYSTAT. The computed value was then divided by the minimum proportion of age-0. fish seen in the late run Upper Station escapement samples (6 August), giving the 95% confidence upper limit value for the proportion of late Upper Station fish in the Inner Akalura catch.

RESULTS

The age composition of the weekly Frazer, Upper Station, and Akalura post 21 July escapement samples are provided in Table 1. The data indicate that Upper Station is the only system in the Alitak Bay District with a recognizable component of age-0. fish (Figure 2). Within this system, weekly escapement samples range from 33.8% to 59.9% age-0. fish, with a majority classified as age-0.2. The highest proportion of age-0. fish (59.9%) in the Upper Station samples occurs in the sample collected on 20 August, the same day as the fishery in Inner Akalura Section (Figure 3).

The sockeye salmon catch sample from the Inner Akalura Section fishery provided age data for 517 fish (Table 1). Only four (0.8%) age-0. fish were present in the sample, and all of these were age-0.2.

The presence of age-0. fish in the Inner Akalura Section catch sample indicates that a component of the catch was Upper Station late run fish. The estimated total contribution of Upper Station fish is 1.3% (Figure 4). The approximate 95% confidence upper limit is 5.2%. In numbers of fish, the point estimate is 124 Upper Station late run fish, and the approximate 95% confidence upper limit is 483 fish.

LITERATURE CITED

- ADF&G (Alaska Department of Fish and Game). 1992-94 Bristol Bay and Westward Alaska commercial fishing regulations salmon and miscellaneous finfish, 1992 edition. Division of Commercial Fisheries, Juneau.
- Holmes, Patrick B. 1992. 1992 operational plan Kodiak Management Area sockeye and coho salmon escapement sampling. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report No. 4K92-25, Kodiak.
- Murphy, Robert L. 1991. Alaska Peninsula and Aleutian Islands Management Catch, Escapement, and Run Statistics, 1989. Alaska Department of Fish and Game, Division of Commercial Fisheries, Technical Fishery Report 91-12, Juneau.
- Wilkinson, Leland. 1990. *SYSTAT*: The System for Statistics. Evanston, IL: SYSTAT, Inc.

Table 1. Age composition of Frazer, Upper Station, and Akalura sockeye salmon escapement samples collected post 21 July, and the Inner Akalura Section sockeye salmon catch of 20 August, 1992.

Date	Sample Size	Age Class (percent)												Total
		0.1	0.2	1.1	0.3	1.2	1.3	2.1	2.2	2.3	2.4	3.2	OTHER	
Frazer Escapement														
7/24	154	0.0	0.0	13.6	0.0	6.5	2.6	7.1	35.7	33.1	0.6	0.6	0.0	100.0
7/31	206	0.0	0.0	16.5	0.0	6.3	0.5	8.3	35.9	28.2	1.0	3.4	0.0	100.0
8/07	211	0.0	0.0	21.8	0.0	4.3	0.5	11.8	37.4	23.2	0.0	0.5	0.5	100.0
8/21-23 ^a	46	0.0	0.0	15.2	0.0	21.7	0.0	2.2	28.3	28.3	0.0	2.2	2.2	100.0
Upper Station Escapement														
7/23-24	109	0.0	33.0	6.4	5.5	9.2	1.8	4.6	34.9	3.7	0.0	0.0	0.9	100.0
7/30-8 ^a	153	0.0	41.8	1.3	7.8	18.3	0.7	7.2	21.6	1.3	0.0	0.0	0.0	100.0
8/6	207	0.0	26.1	0.5	7.7	16.9	5.8	0.0	38.6	4.3	0.0	0.0	0.0	100.0
8/13	199	1.5	30.2	0.5	6.5	18.1	3.0	0.5	36.2	3.0	0.0	0.5	0.0	100.0
8/20	187	2.1	51.9	0.0	5.9	20.3	4.8	0.0	11.2	3.2	0.0	0.5	0.0	100.0
Akalura Escapement														
8/1-6	272	0.0	0.0	0.0	0.0	1.5	5.1	0.4	76.5	16.5	0.0	0.0	0.0	100.0
8/12-13	211	0.0	0.0	0.0	0.0	1.9	3.3	0.0	80.1	14.7	0.0	0.0	0.0	100.0
8/22	70	0.0	0.0	0.0	0.0	0.0	1.4	0.0	85.7	11.4	0.0	1.4	0.0	100.0
Inner Akalura Section Catch (area 257-30)														
8/20	517	0.0	0.8	0.0	0.0	1.5	3.3	0.0	77.6	15.1	0.0	0.0	1.7	100.0

^aCollected at Dog Salmon weir; previous Frazer samples were collected at the fish pass.

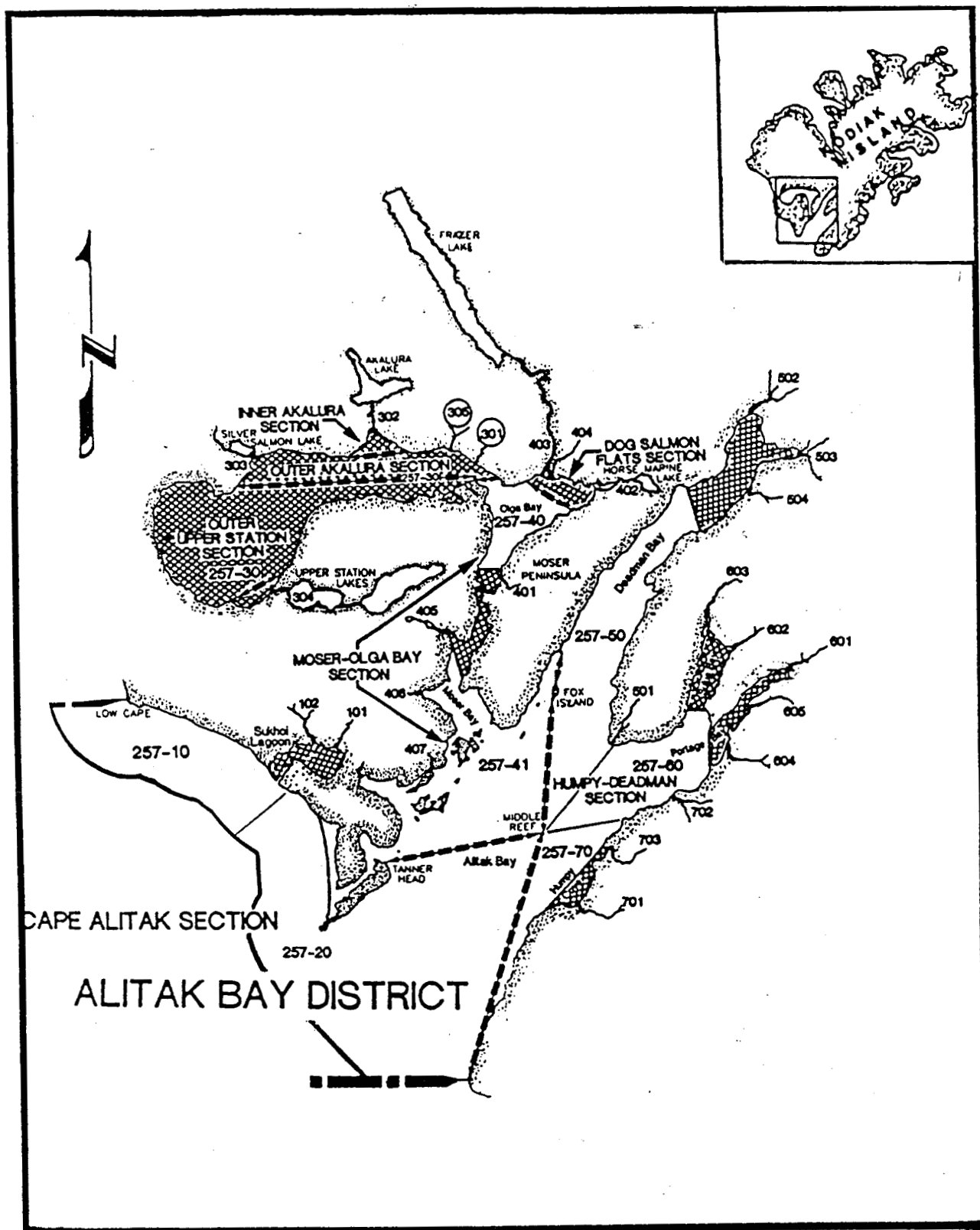


Figure 1. Map of the Alitak Bay District defining statistical sections and locations of selected sockeye salmon systems including Frazer, Upper Station, and Akalura.

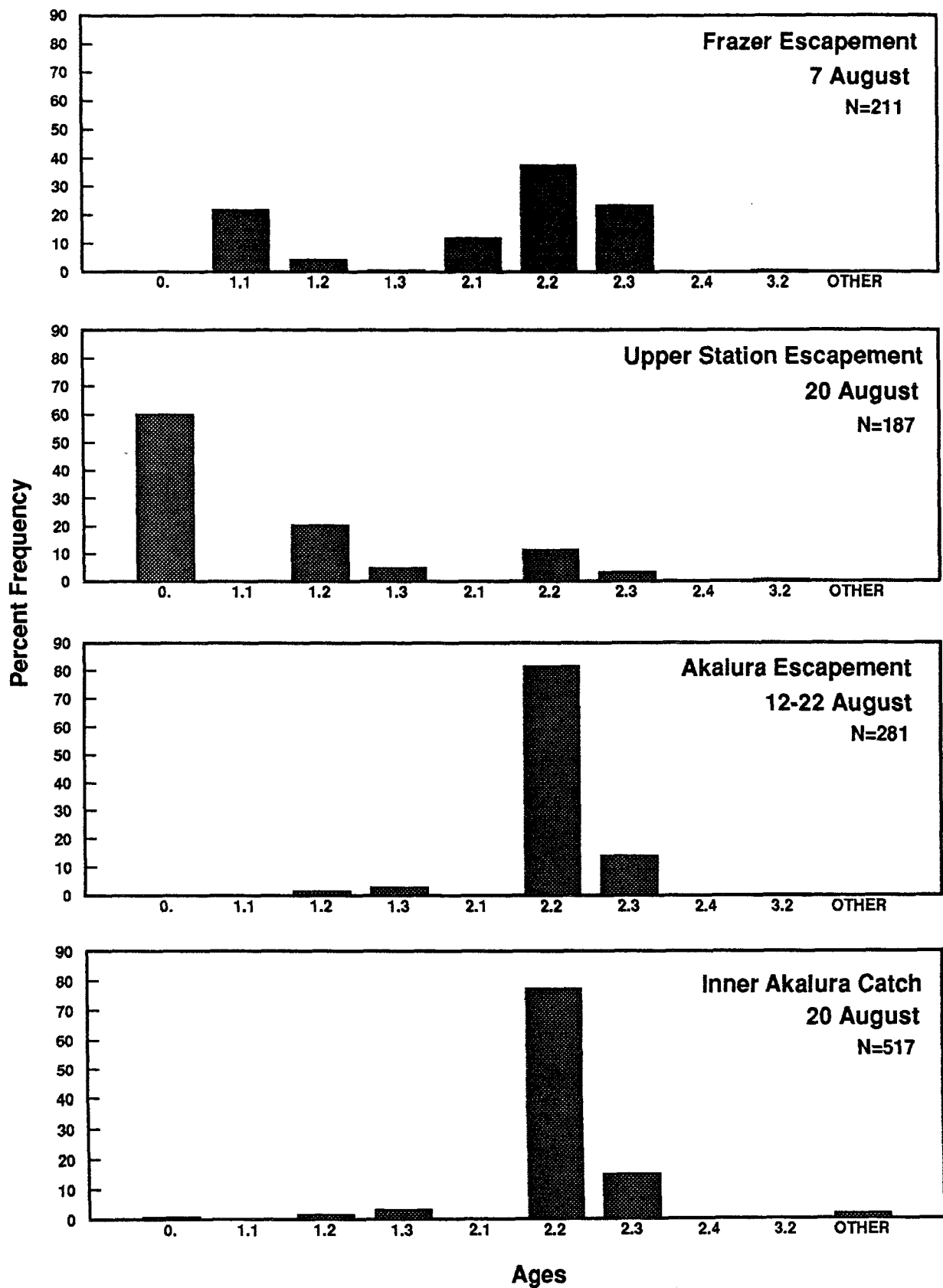


Figure 2. Age composition of the Frazer, Upper Station, and Akalura sockeye salmon escapement samples collected near 20 August, and the age composition of the Inner Akalura Section sockeye salmon catch sample of 20 August, 1992.

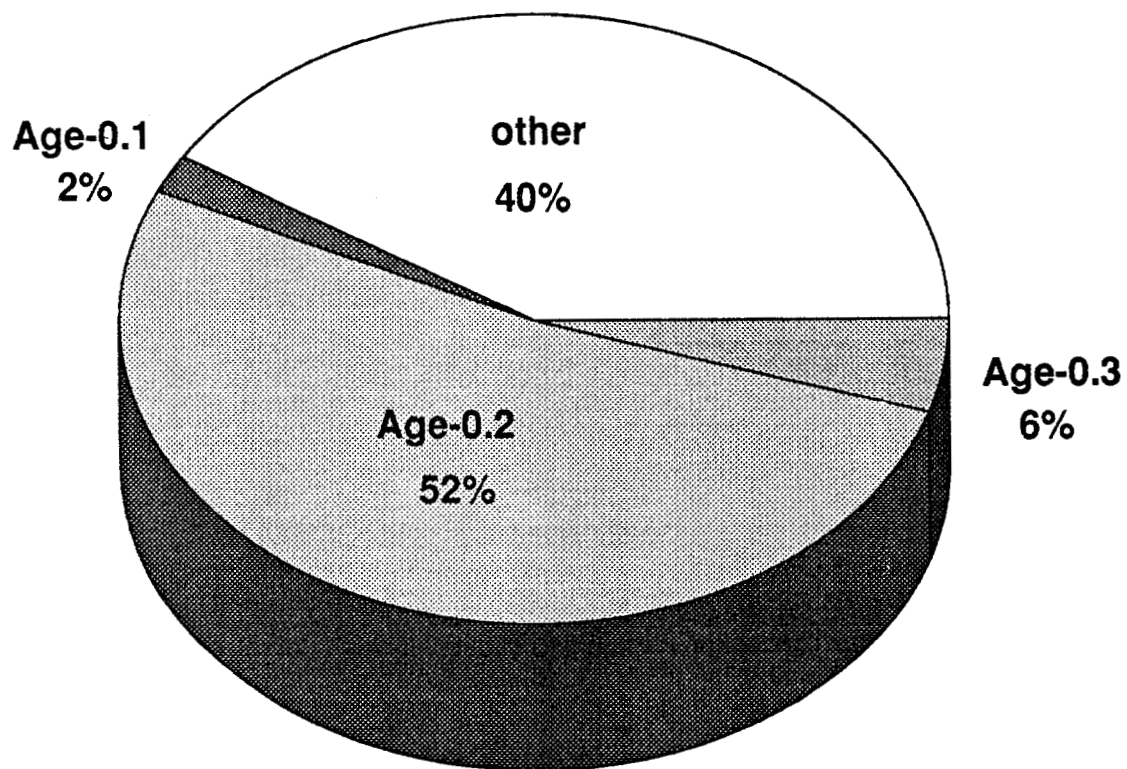


Figure 3. Age composition of the Upper Station sockeye salmon escapement sample with emphasis on the contribution of age-0. fish, 20 August, 1992.

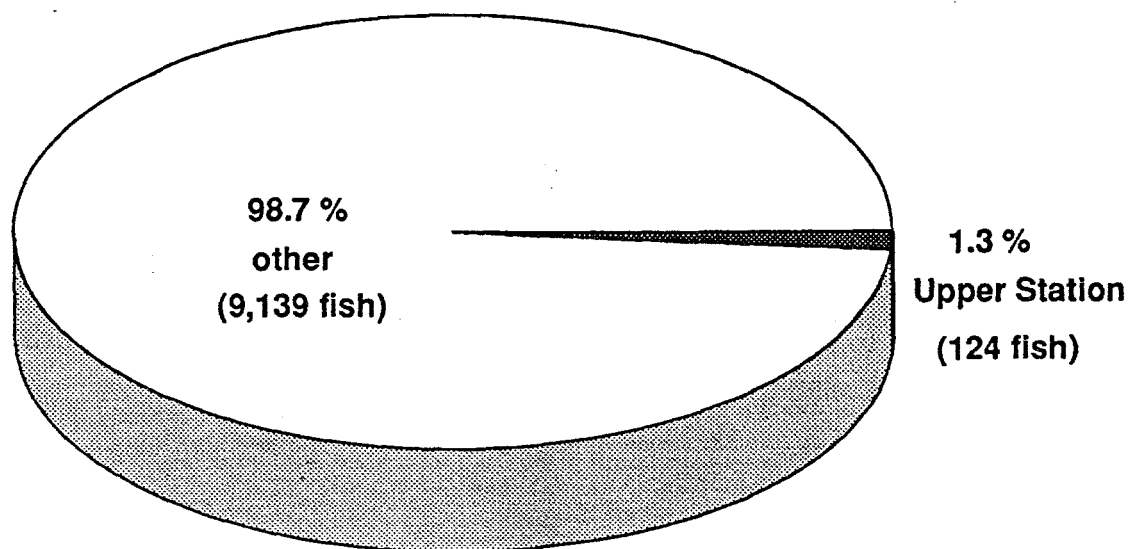


Figure 4. Estimated contribution of Upper Station late run sockeye salmon to the Inner Akalura Section catch, 20 August, 1992.

Appendix A. Alitak Bay District salmon management plan.

5 AAC 18.361. ALITAK BAY DISTRICT SALMON MANAGEMENT PLAN (a) The department shall manage the commercial salmon fishery in the Alitak Bay District in accordance with the guidelines set out in the Alitak Bay District Salmon Management Plan. The goal of this plan is to achieve escapement and harvest objectives of sockeye, pink, and coho salmon stocks returning to the Deadman-Portage Bay Section systems and the Horse Marine, Fraser, Akalura, and Upper Station systems. It is the intent of the board that salmon bound to these systems be harvested to the extent possible by the traditional fisheries located in the Cape Alitak, Deadman-Portage Bay, and Moser-Olga Bay Sections.

(b) The Cape Alitak Section must be managed during the period June 9 through July 15 based on the sockeye salmon return to the Fraser system. During the period July 16 through August 9, in odd numbered years this section must be managed based on the pink salmon return to the Fraser system and, in even numbered years this section must be managed based on the sockeye salmon return to Upper Station. During the period August 10 through August 25, this section must be managed based on the sockeye salmon return to Upper Station but, on even numbered years this section must be managed based on the pink salmon return to the Fraser system. During the period August 26 through season's end, the Cape Alitak Section must be managed based upon the coho and sockeye salmon returns to the entire Alitak District.

(c) The Moser-Olga Bay Section must be managed, during the period June 9 through July 15, based upon the sockeye salmon return to the Fraser system. During the period July 16 through August 9, in odd-numbered years this section must be managed based on the pink salmon return to the Fraser system and, in even-numbered years this section must be managed based on the sockeye salmon return to Upper Station. During the period August 10 through August 25, in odd-numbered years this section must be managed based on the sockeye salmon return to Upper Station and, in even numbered years this section must be managed based on either the pink salmon return to the Fraser system or on the sockeye salmon return to the Upper Station system. During the period August 26 through season's end this section must be managed based on the coho and late sockeye salmon returns to all Olga Bay systems.

(d) The Humpy-Deadman Section must be managed simultaneously, and with equivalent fishing time, with the Cape Alitak and Moser-Olga Bay Sections during the period from June 9 through July 15. After July 15, the Humpy-Deadman Section must be managed based on the strength of returns to systems located within the section.

(e) The Dog Salmon Flats Section must be managed on the basis of sockeye and pink salmon returns to the Fraser River system during the period of June 9 through August 20. During the period of August 21 through season's end this section must be managed on the basis of coho salmon returns to the Dog Salmon River and Horse Marine systems. This section may only be opened to fishing when total desired escapement goals are expected to be exceeded. Such openings may not jeopardize achievement of minimum escapement goals for either of the two remaining salmon species. A 24 hour advance notice must be given before opening this section.

(f) The Inner and Outer Akalura Sections must be managed based on early and late returns of sockeye salmon to the Akalura system during the period from June 9 through August 20. From August 21 through August 26, these sections must be managed based on coho and late sockeye salmon returns to the Akalura system. After August 26, both sections must be managed based on coho salmon returns to the Akalura system. The Inner and Outer Akalura Sections may be opened to fishing only when desired escapement goals are expected to be exceeded. Such openings may not jeopardize achievement of minimum escapement goals for other salmon species. Fishing time in the Outer Akalura Section must always occur before any fishing time in the Inner Akalura Section is allowed for each target species. At least 24 hours advance notice must be given before opening either the Inner or Outer Akalura Sections.

(g) The Inner and Outer Upper Station Sections must be managed based on early and late returns of sockeye salmon to the Upper Station system during the period from June 9 through August 20. From August 21 through August 25, these sections must be managed based on coho and late sockeye salmon returns to the Upper Station system. After August 26, both sections must be managed based on coho and late sockeye salmon returns to the Upper Station system. The Inner and Outer Upper Station Sections may be opened to fishing only when desired escapement goals are expected to be exceeded. Such openings may not jeopardize achievement of minimum escapement goals for the other salmon species. Fishing time in the Outer Upper Station Section must always occur before any fishing time in the Inner Upper Station Section is allowed for each target species. At least 24 hours advance notice must be given before opening of either the Inner or Outer Upper Station Sections.

Appendix B. Commercial Fisheries News Release announcing the
Inner Akalura commercial salmon fishery, 20 August,
1992.

STATE OF ALASKA
Department of Fish and Game
Carl L. Rosier, Commissioner

Westward Region
211 Mission Road
Kodiak, AK 99615

Robert C. Clasby, Acting Director
Division of Commercial Fisheries

Contact: Dave Prokopowich *DP*
Kevin Brennan
Dennis Gretsich
Fishery Biologists

IMMEDIATE NEWS RELEASE

Date: August 18, 1992
5:00 P.M. Tuesday

For E.O. #4-FS-K-33-92
- IN THE KODIAK AREA COMMERCIAL SALMON FISHERY

There will a 9 hour commercial salmon fishing period in the Inner Akalura Section, to run from 12:00 Noon Thursday, August 20 through 9:00 P.M. Thursday, August 20.

Closed Waters Adjustment:

Closed waters will be reduced in the Inner Akalura Section to ADF&G Regulatory Markers located near the mouth of Akalura Creek (stream #257-302).

The advance notice time given prior to any additional commercial salmon fishing period will continue to be at least 42 hours. Fishing time for the Moser-Olga Bay and Cape Alitak Section will not be announced until at least 150,000 late run sockeye salmon have been counted past the weir at Upper Station Lake.

Additional fishing time for the remainder of the Kodiak Management Area is not expected to occur until August 25, 1992. In the event that there are unexpected increases in the abundance of pink salmon there will be at least 42 hours advance notice prior to any area opening to commercial salmon fishing.

Fishermen and Processors are reminded that booklets containing Alaska Board of Fishery proposed changes for Kodiak and Chignik Finfish regulations and Statewide Shellfish regulations are available at the ADF&G office in Kodiak.

Recent fishery information may be obtained by calling the Department's 24 hour record-a-phone at 486-4559.

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